

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

MAILED

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U.S. PATENT AND TRADEMARK OFFICE  
BOARD OF PATENT APPEALS  
AND INTERFERENCES

BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

Ex parte FRANCIS BRIAND,  
CHRISTIAN BONNET and PHILIPPE LEFEBVRE

Appeal No. 2005-0582  
Application No. 09/870,014

ON BRIEF

Before KIMLIN, WARREN and DELMENDO, Administrative Patent Judges.  
KIMLIN, Administrative Patent Judge.

DECISION ON APPEAL

This is an appeal from the final rejection of claims 1, 2, 7-9, 15, 16 and 18-25, all of the claims remaining in the present application. Claim 1 is illustrative:

1. A process for welding one or more metal workpieces to be joined together by producing at least one welded joint between edges to be welded of said metal workpiece or workpieces, said workpiece or workpieces being made of steel, by using at least one laser beam and at least one electric arc, in which process, during welding of the joint, shielding at least one part of a welding zone comprising at least one part of said welded joint during welding with at least one shielding atmosphere formed by a ternary gas mixture consisting of:

argon;

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helium, the argon and the helium with a content greater than or equal to 70% by volume; and

a third gas consisting of O<sub>2</sub> or CO<sub>2</sub> with a content of non zero to 30% by volume.

The examiner relies upon the following references as evidence of obviousness:

Yenni et al. (Yenni)	2,753,427	July 3, 1956
Cook	2,790,656	Apr. 30, 1957
Steen	4,167,662	Sep. 11, 1979
Hamasaki	4,507,540	Mar. 26, 1985
Galantino et al. (Galantino '841)	4,749,841	June 7, 1988
Cherne et al. (Cherne)	4,871,898	Oct. 3, 1989
Galantino et al. (Galantino '866)	4,902,866	Feb. 20, 1990
Beyer et al. (Beyer)	5,821,493	Oct. 13, 1998

Appellants' claimed invention is directed to a process for arc/laser hybrid welding for joining together workpieces made of steel. The process shields at least one part of the welding zone with a ternary gas mixture consisting of argon, helium and an amount of O<sub>2</sub> or CO<sub>2</sub> within the range of greater than zero to 30% by volume.

The appealed claims stand rejected under 35 U.S.C. § 103(a) as follows:

(a) claims 1, 2, 7-9, 15, 22, 23 and 25 over Hamasaki in view of Steen, Yenni, Cherne or Galantino '841;

(b) claims 16, 18, 19 and 21 over the references cited in  
(a) above, further in view of Beyer;

(c) claim 20 over the references cited in (a) above, further  
in view of Cook;

(d) claims 1, 2, 7-9, 15, 22 and 24 over Hamasaki in view of  
Steen and Galantino '866;

(e) claims 16, 18, 19 and 21 over Hamasaki in view of Steen,  
Galantino '866, and Beyer; and

(f) claim 20 over Hamasaki in view of Steen, Galantino '866  
and Cook.

In accordance with the grouping of claims set forth at  
page 3 of appellants' Brief, all of the appealed claims stand or  
fall together with claim 1.

We have thoroughly reviewed each of appellants' arguments  
for patentability. However, we are in complete agreement with  
the examiner that the claimed subject matter would have been  
obvious to one of ordinary skill in the art within the meaning of  
§ 103 in view of the applied prior art. Accordingly, we will  
sustain the examiner's rejections for essentially those reasons

expressed in the Answer, and we add the following primarily for emphasis.

There is no dispute that Hamasaki, like appellants, discloses an arc/laser hybrid welding process for joining steel workpieces in which a mixture of gases is used to shield at least one part of the welding zone. Appellants' principal contention is that Hamasaki does not disclose the claimed ternary gas mixture for shielding in the hybrid arc/laser welding process, and that the secondary references, which do disclose the claimed ternary gas mixture, are directed to an arc welding process, not a hybrid one. Appellants maintain that "the prior art laser welding and arc welding techniques do not have the same results and characteristics when applied to hybrid welding; that is, importation of either laser welding or arc welding techniques into hybrid welding is unpredictable" (page 7 of Brief, second paragraph).

We do not subscribe to appellants' position. In our view, appellants are reading the Hamasaki disclosure too narrowly. As explained by the examiner, Hamasaki teaches that arc (MIG) welding is performed in close proximity to laser welding in the

hybrid process and that a mixture of helium and O<sub>2</sub> can be used as the shield gas for the laser welding, whereas various mixtures, such as argon and CO<sub>2</sub> or argon and helium, can be used as the shield gas for the arc welding (see column 2, lines 36-52). Hence, based on this disclosure, we find that one of ordinary skill in the art would have understood that the area of the weld in close proximity to both the laser and arc welding may use a shield gas comprising a combination of argon, helium and O<sub>2</sub> or CO<sub>2</sub>. As emphasized by the examiner, the appealed claims embrace a process wherein only one part of a welding zone, for example, the portion where the arc and laser welding essentially overlap, is shielded by the claimed gas mixture. Furthermore, the appealed claims also encompass gas mixtures having as little as 0.1% by volume of either O<sub>2</sub> or CO<sub>2</sub>, which is substantially the same as the mixture of helium and argon specifically noted by Hamasaki. Also, we agree with the examiner that Yenni, Cherne and Galantino '841 further buttress the conclusion that it would have been obvious for one of ordinary skill in the art to use a shield gas consisting of argon, helium and O<sub>2</sub> or CO<sub>2</sub> in at least one part of a hybrid arc/laser welding zone.

Appellants cite a public release of The Welding Institute (TWI) for the proposition that the parameters of hybrid welding are unpredictable. Appellants point to the paragraph preceding the "Main Conclusions" which states that "[t]he penetration of these hybrid welds was less than the penetration in laser welds." The publication explains that "[t]his was due to the high arc currents used in the spray metal transfer condition causing an excess of weld metal in the keyhole, effectively blocking the penetration of the laser." We note, however, that no significance is attached to the particular composition of the shield gas. Indeed, in the preceding paragraph, it is stated that the use of the claimed shielding gas in a hybrid welding process gives "25% greater penetration than the laser welds." In our opinion, this limited report falls far short of establishing that shield gas compositions within the scope of the appealed claims are unexpectedly effective in hybrid arc/laser welding processes. It is well settled that absolute predictability is not required for a finding of obviousness under § 103, and we find that the cited prior art provides the reasonable expectation of successfully utilizing the claimed shield gas in at least one part of a

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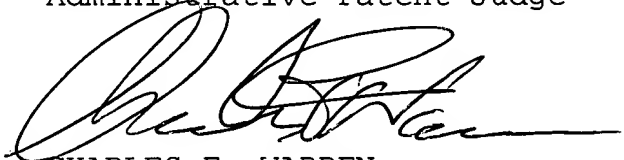
hybrid welding zone. Appellants have proffered no objective evidence which demonstrates that the claimed process produces results that would be considered unexpected by one of ordinary skill in the art.


In conclusion, based on the foregoing and the reasons well-stated by the examiner, the examiner's decision rejecting the appealed claims is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a).

AFFIRMED

  
EDWARD C. KIMLIN )  
Administrative Patent Judge )

  
CHARLES F. WARREN )  
Administrative Patent Judge )  
BOARD OF PATENT )  
APPEALS )  
AND )  
INTERFERENCES )

  
ROMULO H. DELMENDO )  
Administrative Patent Judge )

ECK/psb

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Young & Thompson  
745 South 23<sup>rd</sup> Street  
2<sup>nd</sup> Floor  
Arlington, VA 22202